Hawaiian Electric Company, Inc.

East Oahu Switching Project

Abstract

Hawaiian Electric Company, Inc.'s East Oahu Switching project involves the installation of automation equipment for a key part of the utility's distribution grid, coupled with upgrades to the control and communications platform for grid operators. The distribution automation involves upgrades in eastern Oahu near Honolulu, with eight of the company's 146 overall substations receiving new supervisory control and data acquisition (SCADA) equipment and software. A new automated switch for a 46-kV sub-transmission line, along with a communication and monitoring system, integrates the new automated distribution equipment with the existing grid. Projected benefits include more precise and timely response to outages, enhanced distribution system reliability, and the reduction of operations and maintenance costs.

At-A-Glance

Recipient: Hawaiian Electric Company, Inc.

State: Hawaii

NERC Region: N/A

Total Budget: $10,695,196

Federal Share: $5,347,598

Project Type: Electric Distribution Systems

Equipment

- **Distribution Automation Equipment for 29 Out of 417 Circuits**
  - **Distribution Management System**
  - **Distribution Automation Communications Network**
  - **Automated Distribution Circuit Switches**
- **Substation Automation Equipment for 8 Out of 146 Substations**
  - **SCADA Communications Network**

Key Targeted Benefits

- **Improved Electric Service Reliability and Power Quality**
- **Reduced Operating and Maintenance Costs**
- **Reduced Electricity Costs for Customers**
- **Reduced Truck Fleet Fuel Usage**
- **Reduced Greenhouse Gas and Criteria Pollutant Emissions**

Smart Grid Features

Communications infrastructure includes a new platform for grid operators to monitor the distribution grid. Using a new substation controller device at the central grid control room, operators are able to more rapidly and precisely track outages. SCADA devices are controlled by a data concentrator that serves as a remote terminal unit for the switchgear and is connected to telecommunications equipment to transfer data to the main dispatch center. A smart controller in the main dispatch center analyzes the data and informs the company's energy management system of system conditions.

Distribution automation systems include smart substation controllers to detect loss of power, determine if the cause is related to a specific transmission substation problem, and automatically perform switching at the 46-kv sub-transmission level to restore power to distribution substations. This restoration scheme is accomplished by installing SCADA equipment at eight distribution substations, one 46-kV pole-top disconnect switch, and a smart substation controller in the main dispatch center. If an outage is detected, the smart controller initiates pre-programmed protocols and informs the energy management system to remotely execute line switching at the 46-kV pole-top and re-energize distribution substations. The project is expected to be lower in cost than a traditional construction line upgrade project, improve reliability in the project's service area, and reduce response time for customer outages.

Hawaiian Electric Company, Inc. *(continued)*

Timeline

Key Milestones	Target Dates
Distribution automation construction start	Q3 2010
Smart control system installed	Q4 2011
Distribution automation construction complete	Q1 2012

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